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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hiroki Matsuoka

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EXAMINER

NGUYEN, TU MINH

ART UNIT

PAPER NUMBER

3748

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,205	Applicant(s) MATSUOKA ET AL.	
	Examiner TU M. NGUYEN	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7 is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. An Applicant's Amendment filed on April 30, 2010 has been entered. Claim 2 has been canceled; and claims 1, 3, 7, and 8 have been amended. Overall, claims 1, 3, and 5-8 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1, 3, 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakamoto (U.S. Patent 6,199,372) in view of Imai et al. (U.S. Patent Application 2004/0035101) and Nakata (U.S. Patent 6,829,886).**

Re claims 1 and 8, as shown in Figures 1-3, Wakamoto discloses an exhaust purifying apparatus and an exhaust purifying method for an internal combustion engine (1) on a vehicle, the apparatus comprising:

- a fuel adding valve (7, 10) for injecting fuel in exhaust gas;
- a regeneration control section (17), wherein the regeneration control section controls regeneration of an exhaust purification catalyst (3) through heating control, in which fuel is

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supplied to the exhaust purification catalyst via the fuel adding valve, thereby increasing a bed temperature of the catalyst; and

- a determining section (17) that determines (in step 4) whether a catalyst inlet temperature is less than a threshold value due to a low engine load (see lines 3-8 of column 8), wherein the regeneration control section suspends the heating control when the determining section determines that the catalyst inlet temperature is less than a threshold value due to the low engine load (see lines 3-8 of column 8).

Wakamoto, however, fails to specifically disclose that the engine is under low load during the vehicle being driven downhill; that the regeneration control section suspends the heating control only when the determining section continuously determines for a predetermined period that the vehicle is driving downhill; and that the determining section determines that the vehicle is driving downhill when the amount of fuel injected by a fuel injection valve of the engine is equal to or less than a predetermined amount and the vehicle speed is equal to or greater than a predetermined speed.

As shown in Figure 1, Imai et al. disclose a regenerative control system for an internal combustion engine of a vehicle, comprising an oxidation catalyst (3) and a particulate filter (4). As indicated in paragraphs 0016-0018, Imai et al. teach that a regeneration of the filter is adversely effected when a catalyst temperature becomes low due to the vehicle being driven downhill, which causes the engine to be under a low load condition. As shown in Figure 3 and indicated in paragraph 0116, Imai et al. further teach that it is conventional in the art to suspend the regeneration of the filter when a catalyst temperature is less than a threshold value (T_{d1}) for a duration longer than a predetermined period (t_4). It would have been obvious to one having

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ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Imai et al. in the apparatus and method of Wakamoto, since the use thereof would have been routinely practiced by those with ordinary skill in the art to efficiently regenerate an exhaust purification catalyst.

As shown in Figure 1, Nakata discloses an emission control apparatus of internal combustion engine to retard a deterioration of an emission control catalyst (3) during a fuel-cut operation of the engine. As depicted in step 90I in Figure 8 and indicated on lines 12-20 of column 14, Nakata teaches that it is conventional in the art to judge an operating state of the engine being in a low load condition (i.e., vehicle coasting) by determining at least one of a zero depression of an accelerator pedal and a vehicle speed equal to or greater than a predetermined speed in order to execute a fuel-cut operation (in step 903). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Nakata in the apparatus and method of Wakamoto, since the use thereof would have been routinely practiced by those with ordinary skill in the art to improve a gas mileage of the vehicle.

Re claim 3, in the modified apparatus of Wakamoto, as taught by Nakata, the determining section determines that the amount of fuel injected by the fuel injection valve is equal to or less than the predetermined amount when fuel cutoff control, in which fuel injection by the fuel injection valve is suspended, is being executed.

Re claims 5-6, in the modified apparatus of Wakamoto, as taught by Imai et al., while the heating control is suspended due to determination of the determining section that the vehicle is driving downhill, the regeneration control section resumes the heating control if the determining

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section determines that the vehicle is not driving downhill (step S42 with YES answer, steps S44a-S44b), wherein the regeneration control section resumes the heating control only when the determining section continuously determines for a predetermined period (t2) that the vehicle is not driving downhill.

Allowable Subject Matter

4. Claim 7 is allowed.

Response to Arguments

5. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that Nakata fails to teach or suggest a determining section determines that the vehicle is driving downhill when a vehicle speed is equal to or greater than a predetermined speed (page 7 of Applicant's Amendment), the examiner respectfully disagrees.

The text on lines 12-20 of column 14 in Tanaka reads as follows:

"It is then determined in step 901 whether a condition for executing the fuel-cut operation is met. The fuel-cut operation executing condition in step 901 is, for example, that the engine warm-up has been completed, or that the engine revolution speed is greater than or equal to a predetermined engine revolution speed, or that the amount of depression of the accelerator pedal is zero (the accelerator is completely released), or that the vehicle running speed is greater than or equal to a predetermined value, etc." (emphasis added by examiner)

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Based on the above disclosure, Tanaka determines that a fuel-cut operation is met when the engine of the vehicle is under low load such as in a downhill driving condition, wherein said driving condition is met when a vehicle speed is equal to or greater than a predetermined speed.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Communication

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tu M. Nguyen/

TMN

Tu M. Nguyen

July 16, 2010

Primary Examiner

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